

Graduate Students in U.S. Schools of Public Health: Comparison of 3 Academic Years

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FEDERAL PROGRAMS that support students and schools of public health are among the oldest of all Federal efforts on behalf of education for the health professions. Traineeship funds were first authorized in 1956. The Hill-Rhodes program of formula grants was enacted in 1958, and projects grants were authorized 2 years later. Yet reliable data on students, faculty, educational programs, and costs have not been readily available. Before 1974, no coordinated, controlled system of data collection existed among the schools. For 9 years, beginning in 1961, the American Public Health Association collected some information on students and faculty, but that effort lapsed after 1970. In 1974, the Division of Associated Health Professions, Bureau of Health Manpower, Health Resources Administration, contracted for a new data collection effort that would facilitate an assessment of manpower training for public health and the impact of Federal assistance.

During the early 1960s, when fewer than 12 schools graduated less than 2,000 students, data could be collected on a demand basis without significant hardship on the schools or without delay in receiving an adequate response. In 1977-78 there were 20 schools with a combined enrollment of more than 6,800 students and a faculty in excess of 1,750. Professional education in these schools is organized around approximately 21 major specialties. Yet specialty emphasis, curriculums, and administrative organization vary considerably among the schools, as do statistical and fiscal accounting procedures.

In an effort to collect needed information, the Division of Associated Health Professions contracted with

the Association of Schools of Public Health in 1974 to establish a data center that would collect and process data on applicants, students, graduates, faculty, educational costs, programs, and research activities. Under the initial contract and a second one awarded in April 1977, the Association of Schools of Public Health Data Center has planned and established a system to collect, analyze, and report information that could be regarded as reliable, valid, and uniform both for the individual schools and in the aggregate.

The student data reported in this article reflect only one aspect of the effort mounted by the data center. Separate reports on characteristics of faculty, applicants, and graduates have been produced for the academic years 1975-76, 1976-77, and 1977-78, and a similar report on current research activities was produced for 1976-77. The products of this effort have been used successfully by several groups carrying out programs, research activities, and investigations that required specific program data about the schools of public health. Ad hoc requests from educational associations and various government units have been answered. Each of these requests has been met by discrete analysis of the data by the University of North Carolina Computer Center. It is anticipated that requests and reports such as those reviewed here will continue to be met, at least for the life of the current contract, and afterwards on a somewhat modified scale. The data center has developed the capability to provide timely information for a comprehensive review of the public health production system and the contribution of its graduates.

This report concentrates on the data that have become available on the characteristics of students enrolled in public health schools during the academic years 1975-76, 1976-77, and 1977-78. These efforts consist of essentially three phases: obtaining the information, processing the data, and producing the specific reports desired.

A set of 15 specializations in public health was identified at the outset and was modified in subsequent years as a result of experiment and suggestions from the indi-

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vidual schools. A set of 17 specializations was used in compiling 1976-77 figures, and 21 were identified in 1977-78. As a result, several categories show apparent changes that do not reflect real shifts in enrollment. Biomedical laboratory sciences, previously coded under epidemiology, was reported separately in 1977-78.

Table 1. Percentage distribution of students enrolled in schools of public health, by ethnic group and sex, 1975-76 to 1977-78¹

Ethnic group and sex	1977-78 (N = 6,463)	1976-77 (N = 6,217)	1975-76 (N = 6,024)
American Indian	1.1	1.1	1.0
Male	0.5	0.6	
Female	0.6	0.6	
Asian-Hawaiian	7.6	8.4	6.9
Male	4.0	4.5	
Female	3.5	3.9	
Black	6.6	7.7	7.2
Male	3.5	3.6	
Female	3.1	4.0	
Hispanic	4.8	4.2	6.2
Male	2.4	2.2	
Female	2.4	2.0	
White	77.4	75.7	75.1
Male	38.4	38.8	
Female	38.8	36.7	
Unknown	2.5	3.0	1.1
Total	100.0	100.0	100.0
Male	50.0	51.2	52.5
Female	49.4	48.3	47.5

¹ Percentages affected by rounding and by 37 students of unreported sex in 1977-78 and 35 students of unreported sex in 1976-77.

Table 2. Percentage of students in schools of public health, by type of degree program and sex, 1977-78

Type of degree program	Men (N = 3,233)	Women (N = 3,193)	Total ¹ (N = 6,463)
Bachelor's	0.5	1.2	0.9
MPH	43.6	53.7	48.4
MSPH	6.5	5.0	5.8
Other master's ²	22.1	19.3	20.7
DrPH	5.6	6.0	5.8
PhD	11.4	7.5	9.5
Other doctorate	5.2	3.4	4.3
Postdoctorate	1.2	0.5	0.8
Joint-MD MPH	0.6	0.2	0.4
Other	3.4	3.3	3.5

¹ Percentages are affected by 37 students of unreported sex included in total.

² Includes master of science, master of science in hygiene, master of hospital administration, master of health services administration, master of health science, and several other degrees.

NOTE: Totals may exceed 100 percent due to rounding.

Health planning, coded under health administration in 1975-76 and 1976-77, and international health were identified separately in 1977-78.

The data center's task was to compile and analyze information reported by the schools. At specified dates during the school year, each school sent the results of

Table 3. Percentage of students reporting post-baccalaureate public health work experience, by length of experience and sex, 1977-78

Public health work experience	Men (N = 3,233)	Women (N = 3,193)	Total ¹ (N = 6,463)
None or 6 months	19.5	19.3	19.3
7 months to 3½ years	30.0	31.3	30.6
More than 3½ years	24.7	27.1	25.8
Unknown	25.8	22.3	24.3

¹ Percentages are affected by 37 students of unreported sex included in total.

Table 4. Percentage of students choosing various areas of specialization, by sex, 1977-78¹

Area of specialization	Men (N = 3,233)	Women (N = 3,193)	Total ² (N = 6,463)
Behavioral and social sciences	2.6	4.0	3.3
Biomedical laboratory sciences	5.0	3.4	4.2
Biostatistics	7.4	6.2	6.8
Dental public health	1.2	0.6	0.9
Dietetics . . . . .	...	0.2	0.1
Environmental health	17.1	6.5	11.8
Epidemiology	12.6	10.9	11.8
Gerontology	0.3	0.8	0.6
Health administration	17.0	16.1	16.6
Health planning	3.2	3.7	3.4
Health policy	2.1	2.5	2.3
Hospital administration	6.3	2.9	4.6
International health	2.4	2.1	2.2
Maternal and child health	2.4	5.9	4.1
Mental health	2.0	3.1	2.6
Nutrition	2.9	9.0	5.9
Occupational health	5.3	1.8	3.5
Population studies	2.3	5.3	3.7
Public health education	4.7	8.4	6.5
Public health nursing	0.2	4.3	2.2
Public health social work	0.2	0.2	0.2
Other	2.9	2.1	2.7

¹ Totals may exceed 100 percent due to rounding.

² Percentages affected by 37 students of unreported sex included in total.

its own questionnaires to the center in Arlington, Va., for coding. Under an arrangement with the School of Public Health at the University of North Carolina, coded information was sent to Chapel Hill for computer processing. The data processing staff there compiled the data, arranged frequency distributions for evaluation of completeness and accuracy, and generated printout tables in the forms requested by the center. These printouts were returned to the data center, where the staff restructured the information and had it printed each year in book form for the schools and the Federal Government.

As of October 15, 1977, the 20 schools reported a total enrollment of 6,841 students. Of these, 6,463 students completed usable questionnaires, constituting a response rate of 94.4 percent. Eight schools showed 100 percent participation in the survey. Response rates of 95 percent or better were shown by 4 schools, 85 to 95 percent by 3 schools, 75 to 85 percent by 4 schools, and less than 50 percent by 1 school. These response rates are comparable to an overall response rate of 94 percent for 1976-77 and 93.3 percent for 1975-76.

General Characteristics

Tables 1 through 7 show selected characteristics of students enrolled in all schools for the years 1975-78. While U.S. citizens clearly and not surprisingly pre-

dominate, foreign students have maintained a small but stable share of the total enrollment, averaging 9.7 to 9.8 percent each year. In the text and tables that follow, no distinction is made between characteristics of American and foreign students.

Professional education for public health is offered almost exclusively at graduate levels. Only 55 students enrolled in undergraduate degree programs in 1977-78. Master's degree programs drew the lion's share of all students, with 4,839 enrolled in 1977-78.

The principal degrees offered by the schools of public health traditionally have been the master of public health (MPH) and the master of science in public health (MSPH). MPH programs continue to draw roughly 48 percent of the total (48.4 percent in 1977-78), but the growth of new master's programs has cut into MSPH enrollments. More than five such programs have been identified, the most popular of which are the master of science (MS), the master of science in hygiene, the master of health services administration (MHSA), the master of hospital administration (MHA), and the master of health science (MHS). These programs grew from a 13.9 to a 20.7 percent share of the total in 1977-78, while the proportion of students in MSPH programs was nearly halved. The two principal doctorate programs, the doctor of philosophy (PhD) and the doctor of public health (DrPH)

Table 5. Percentage of students choosing various areas of specialization, by ethnic group, 1977-78¹

Area of specialization	American Indian (N = 74)	Asian-Hawaiian (N = 490)	Black (N = 423)	Hispanic (N = 311)	White (N = 5,003)	Total ² (N = 6,463)
Behavioral and social sciences	12.2	1.4	1.9	2.9	3.5	3.3
Biomedical laboratory sciences	1.4	6.1	3.8	4.8	4.1	4.2
Biostatistics	2.7	11.9	2.4	4.2	7.0	6.8
Dental public health	...	1.2	1.4	0.3	0.9	0.9
Dietetics	...	0.2	...	...	0.1	0.1
Environmental health	8.1	14.1	7.3	10.3	12.2	11.8
Epidemiology	4.1	9.4	8.0	8.7	12.3	11.8
Gerontology	...	2.5	0.2	...	0.5	0.6
Health administration	27.0	9.6	22.2	19.6	16.6	16.6
Health planning	4.1	3.5	6.9	3.9	3.2	3.4
Health policy	1.4	1.8	1.4	1.0	2.5	2.3
Hospital administration	5.4	1.8	5.4	5.8	4.8	4.6
International health	...	5.3	3.1	2.3	1.9	2.2
Maternal and child health	4.1	6.1	6.2	4.2	3.8	4.1
Mental health	2.7	0.6	1.9	1.9	2.9	2.6
Nutrition	5.4	6.3	6.2	8.7	5.8	5.9
Occupational health	1.4	2.1	2.1	2.3	3.8	3.5
Population studies	4.1	7.0	4.5	8.0	3.0	3.7
Public health education	5.4	6.5	9.9	8.7	6.2	6.5
Public health nursing	5.4	0.8	1.7	...	2.5	2.2
Public health social work	...	...	0.5	...	0.2	0.2
Other	5.4	1.8	3.0	2.5	2.2	2.7

¹ Totals may exceed 100 percent due to rounding.

² Percentages affected by 162 students of unreported race included in total.

have shown relatively stable enrollments (most recently 9.5 and 5.8 percent).

Enrollments of men and women have been and remain roughly equal, although the number of women has grown somewhat faster. The 3,193 women enrolled accounted for 49.4 percent of the total in 1977-78, up from 2,857 and 47.5 percent in 1975-76. White students constituted a clear majority, occupying 5,003 (77.4 percent) of the places available in 1977-78. Asians were the next largest group, with 490 students (7.6 percent). The 423 black students accounted for 6.5 percent of all places and 311 Hispanic students for 4.8 percent in the same year. The 74 American Indians and Alaska Natives constituted 1.1 percent of the total.

Although a 3-year study provides insufficient basis for identifying trends in the data, the numbers and percentages of the ethnic groups enrolled have fluctuated mildly. The number of Whites has grown steadily from

4,525 to 5,003 and from 75.1 to 77.4 percent. The number of Asian students fell from 520 to 490 in the latest year of the study, but their numbers and percentage remained above 1975-76 levels. The number of Black students increased in the second year, then declined below first-year levels in 1977-78. Hispanic enrollments dropped 2 percentage points (roughly one-third of the total) in 1976-77, then rose slightly the following year, but not to the earlier level. Enrollments of American Indians have increased slightly from year to year, but remain a nearly constant fraction.

Schools of public health no longer primarily train workers for the traditional State or local health department setting. In response to a demand for new types of health workers and a broader concept of public health, the schools have made major efforts to train students in health administration and environmental health, now the two most frequently chosen areas of specialization. Health administration attracted 1,069 students in 1977-78, or 16.6 percent of the total. With health planning and policy studies counted in, as they were 2 years before, that total would be still higher. Hospital administration, treated as a separate discipline, drew an additional 299 students (4.6 percent) in 1977-78. Because biomedical laboratory sciences was reported separately, environmental health narrowly displaced epidemiology as the second most frequently chosen specialty by a count of 764 students to 759. Biostatistics ranked third with 440 students in 1977-78 (6.8 percent), while health education was fourth with 421 students (6.5 percent) and nutrition fifth with 382 students (5.9 percent). Biomedical laboratory sciences drew 273 students and ranked seventh.

As shown in table 6, 56.6 percent of all students in 1977-78 reported using traineeships, scholarships, fellowships, and grants to help finance their education.

Table 6. Percentage of students reporting methods of paying educational costs, by source of funds and sex, 1977-78

Source of funds	Men (N = 3,233)	Women (N = 3,193)	Total ¹ (N = 6,463)
Traineeships, and so forth ²	57.7	55.6	56.6
Employer subsidy	15.2	9.2	12.3
Veterans' benefits	6.8	1.2	4.0
Full-time work	13.3	11.1	12.2
Part-time work	24.6	26.5	25.5
Loans	17.4	20.8	19.0
Family	23.5	32.4	27.9
Savings	35.5	38.2	36.8
Unknown	2.6	2.6	2.7

¹ Percentages affected by 37 students of unreported sex included in total.

² Includes traineeships, scholarships, fellowships, and grants.

Table 7. Percentage of students reporting methods of paying educational costs, by source of funds and ethnic group, 1977-78

Sources of funds	American Indian (N = 74)	Hawaiian-Asian (N = 490)	Black (N = 423)	Hispanic (N = 311)	White (N = 5,003)	Total ¹ (N = 6,463)
Traineeships, and so forth ²	77.0	58.6	63.4	56.3	55.9	56.6
Employer subsidy	18.9	11.6	12.5	14.1	12.2	12.3
Veteran's benefits	6.8	1.0	3.8	3.2	4.4	4.0
Full-time work	10.8	8.0	14.2	7.4	12.8	12.2
Part-time work	10.8	25.1	13.9	17.7	27.0	25.5
Loans	8.1	11.4	25.5	19.3	19.6	19.0
Family	9.5	25.9	15.6	20.6	29.5	27.9
Savings	13.5	33.1	18.0	22.8	39.6	36.8
Unknown	2.7	1.0	4.0	7.4	2.3	2.7

¹ Percentages are affected by 162 students of unreported race included in total.

² Includes traineeships, scholarships, fellowships, and grants.

Personal savings were used by 36.8 percent, and 27.9 percent reported family assistance. Part-time work was reported by 25.5 percent, 12.2 percent worked full time, and another 12.3 percent were subsidized by an employer. Loans were reported by 19 percent, and 4 percent used veterans' benefits. Assistance from Federal traineeship funds was received by 2,349 students, or 36.3 percent of the total (not shown in the tables).

Public health career education continues to draw students from among persons who have significant work experience in public health agencies before enrollment (table 3). In the 1977-78 survey, the first in which such questions were asked, less than 20 percent reported no work experience or less than 6 months' work experience in public health. Another 24.3 percent did not respond to the question. But 56.4 percent of all students reported more than 6 months' work experience in a public health agency and 30.6 percent had between 7 months' and 3½ years' experience. Of all the students enrolled, 25.8 percent had worked in public health agencies for more than 3½ years before beginning graduate work in public health.

Degree Programs

Total enrollments of men and women were roughly equivalent, but such was not the case for all degree programs. Approximately equal numbers of men and women were enrolled in all the master's degree programs. In MPH programs, women outnumbered men, 1,714 to 1,408. MSPH programs had 211 men and 160 women, joint MD-MPH programs had only 18 men and 7 women, and postdoctorate programs enrolled 38 men and 16 women. Men predominated in PhD programs, 369 to 238, but women held 192 of 375 places in DrPH programs.

The degree programs most frequently chosen by men and the percentage of their numbers enrolled were MPH (43.6), other master's (22.1), PhD (11.4), and MSPH (6.5). The degree programs most frequently chosen by women and the percentage of their numbers enrolled were MPH (53.7), other master's (19.3), PhD (7.5), and DrPH (6.0).

As noted in table 2, the most sought degree programs were the MPH, other master's (a blanket term that covers more than five different degrees), MSPH, and PhD. This rank order was virtually identical for all ethnic groups, although the percentages enrolled varied for each of the four most popular degree programs. For example, a higher proportion of White students (10.3 percent) were enrolled in PhD programs, although Asians and Hawaiians were a close second (9.6 percent). DrPH programs were chosen more often than PhD programs by Blacks and Hispanics, and a higher proportion of Blacks than Whites enrolled for the DrPH. MS pro-

grams were chosen more frequently by Hispanics than by any other group: 17.4 percent of their numbers enrolled for the MS, compared with 9.8 percent for Asians and 9.5 percent for Whites.

Areas of Specialization

Tables 4 and 5 show the areas of specialization most frequently chosen by students enrolled during 1977-78. Health administration ranked high for both men (second) and women (first), but their choices further down the list diverged more sharply. Among women, epidemiology was the second most frequently chosen specialization, drawing 10.9 percent of their number. Nutrition ranked third (9 percent), public health education fourth (8.4 percent), and environmental health fifth (6.5 percent). Among men, environmental health was the most popular specialization (17.1 percent), edging out health administration (17 percent). Epidemiology ranked third (12.6 percent), with biostatistics fourth (7.4 percent), and hospital administration fifth (6.3 percent). Maternal and child health (seventh among women) did not rank among the 11 specializations most frequently chosen by men, while neither hospital administration nor occupational health (sixth among men) ranked in the women's top 11.

Health administration retained the specialization most frequently chosen by all ethnic groups, except Asians and Hawaiians. Other specialization choices, however, varied from group to group. Among Whites, for example, the rank order of specializations was virtually the same as for the entire sample. Indeed, since Whites constituted 77.4 percent of the total, the overall figures were most strongly influenced by their choices.

Asians and Hawaiians enrolled most frequently in environmental health (14.1 percent chose this specialty). Biostatistics ranked second, drawing 11.9 percent, followed by health administration (9.6 percent) and epidemiology (9.4 percent). Population studies, 10th among all students, was their 5th most frequent choice, a preference matched only among Hispanics, who ranked it 6th.

Health administration was the most popular specialization among Black students, drawing 22.2 percent. Health planning (12th among all students) also ranked high, drawing 6.9 percent for 5th place. Public health education placed second (9.9 percent) with epidemiology third (8.0 percent) and environmental health fourth (7.3 percent). Maternal and child health, the third most popular specialization among Blacks surveyed in 1976-77, drew only 6.2 percent, in contrast to 10.1 percent the previous year.

Hispanics, who enrolled most frequently in public health education (16.2 percent) and hospital adminis-

tration (14.6 percent) in 1976-77, showed different enrollment patterns in 1977-78. Health administration drew 19.6 percent (compared with 12.7 percent the previous year) followed by environmental health (10.3 percent), and epidemiology, nutrition, and public health education tied for third with 8.7 percent each. Hospital administration dropped sharply, drawing only 5.8 percent of all Hispanic students in 1977-78.

Health administration continued to be the most popular specialization among American Indians and Alaska Natives, drawing 27 percent of their number in 1977-78. Behavioral and social science specializations continued to be popular for the second consecutive year, drawing 12.2 percent for second place.

Biomedical laboratory sciences, first identified as a separate specialty in 1977-78, was most popular with Asians and with Whites, ranking seventh and eighth respectively.

Methods of Financing Education

In 1977-78, 6,841 students reported 12,551 sources of funds for their education, indicating that, on the average, a student needed more than one source of funds. Men and women reported traineeship support in almost equal numbers, although men reported using traineeships somewhat more often. This reversed the finding of the previous year, when a slightly greater number and percentage of women reported traineeship support. Men were somewhat more likely to work full time (13.3 to 11.1 percent) or to be subsidized by an employer (15.2 to 9.2 percent). Men, not surprisingly, also made far greater use of veterans' benefits (6.8 to 1.2 percent). Women were more likely to work part time while in

school (26.5 to 24.6 percent), made greater use of loans (20.8 to 17.4 percent) and personal savings (38.2 to 35.5 percent). Women also reported more frequent family assistance (32.4 to 23.5 percent).

Methods of paying educational costs varied distinctly among the ethnic groups surveyed. American Indians and Alaska Natives reported traineeship support most frequently, with 77 percent of their number receiving such aid. Blacks (63.4 percent) also used traineeship funds somewhat more than average. Blacks were more likely to work full time than any other group: 14.2 percent of their number reported full-time work, compared with 12.8 percent for Whites. Blacks also were more likely to use loans: 25.5 percent reported loans, compared with 19.6 percent of the Whites and 19.3 percent of the Hispanics.

American Indians and Hispanics were most likely to be subsidized by an employer: 18.9 percent of all American Indians and 14.1 percent of all Hispanics reported employer subsidies. American Indians were most likely to use veterans' benefits, with 6.8 percent of their number reporting such use, compared with 4.4 percent among Whites. Whites, with 27 percent of their number reporting such work, and Asians, with 25.1 percent, were most likely to work part time. They were also most likely to use personal savings and family assistance: 69.1 percent of the Whites and 59 percent of the Asians reported such financing.

On the average, Whites tended to use more sources of funds than members of other groups. Whites reported an average of 2.03 sources of funding, Asians and Hawaiians 1.75, Blacks 1.71, Hispanics 1.69, and American Indians 1.58.

SYNOPSIS

CRAWFORD, B. L. (Bureau of Health Manpower, Health Resources Administration): *Graduate students in U.S. schools of public health: Comparison of 3 academic years. Public Health Reports, Vol. 94, January-February 1979, pp. 67-72.*

Although the Federal Government has authorized financial assistance to schools of public health since 1957, uniform and reliable data on students, faculty, and programs have been lacking. Under the stimulus of legislation requiring an assessment of the impact of Federal support, the Division of Associated Health Professions, Bureau of Health Manpower, contracted with the Association of Schools of Public Health to

establish a data center and analyze information reported by the schools.

Information on characteristics of students enrolled over the past 3 academic years indicate that public health schools are making major efforts to train students in areas other than those traditionally associated with the State or local health department. Health administration and environmental health are now the most frequently chosen specializations. With the growth of demand for new types of health services and increased numbers of administrators inside and outside the public sector, students are seeking these fields, and the schools of public health are responding to the demand.

Women and men are receiving public health training in roughly equal numbers, although enrollments of women are growing slightly faster than enrollments of men. Minority students constituted 20.1 percent of the total in 1977-78: Blacks 6.6 percent; Asians, Hawaiians, and Pacific Islanders, 7.6 percent; Hispanics, 4.8 percent; and American Indians and Alaska Natives, 1.1 percent. Traineeship funds, the majority of which come from the Federal Government, were used by 56.6 percent of all students in 1977-78, with minority students reporting traineeship support substantially more frequently than the average of all students.